Heating • Piping and Air Conditioning

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As will be noted, these abstracts are classified under general heads. In looking for information on a specific subject, it will be well to look through the abstracts under the most suitable heading, and also to look through those under the other headings. For example, some of the heating articles also contain information on air conditioning, and vice versa, *as the grouping has been made on the basis of the subject most prominently covered in the article.*

The index to the Journal Section *of the* American Society of Heating and Ventilating Engineers *is separate* (*see page* 720).

This index does not include Equipment Developments; Book Reviews; Booklets, Reports, and Papers; Recent Trade Literature; and Conventions and Expositions, departments appearing regularly each month. The Editor's Page in each issue includes items of news, comments on current events, etc.

Directory Section.
Vol. 8, No. 1. January, 1936. *p.* 187 (*back section*).
Directory section of heating, piping and air conditioning equipment for industry and large buildings; products classified; trade names; manufacturers' names and street addresses.

Air Conditioning

Absorption Refrigeration Unit Cools Brine for Air Conditioning an Inn, by B. H. Jennings.
Vol. 8, No. 11. November, 1936. *p.* 590.
Absorption refrigeration unit for air conditioning Tressler Inn, Trevorton, Pa.; estimating power requirements; furnishing refrigeration for food storage; brine storage system; anthracite fired boiler unit; layout of equipment; control; air conditioners.

A. C. M. A. Conditioning Application Standards.
Vol. 8, No. 7. July, 1936. *p.* 98 (*back section*).
Application engineering standards for comfort air conditioning adopted by *Air Conditioning Manufacturers Association;* standards reprinted. (Also see August, 1936, issue, p. 91, back section.)

Adopt Standard Refrigeration Symbols.
Vol. 8, No. 9, September, 1936. *p.* 503.
Standard refrigeration symbols adopted by *Refrigeration Machinery Association* and *Air Conditioning Manufacturers Association.*

Air Condition the Bakery Throughout, by W. W. Reece.
Vol. 8, No. 8. August, 1936. *p.* 419.
Generally accepted applications of air conditioning in bakery plants; complete bakery air conditioning; layout of typical plant; air conditions required; segregating sources of heat; advantages of bakery air conditioning; plan of bakery showing conditions to be maintained in each department.

Air Conditioned Test Rooms Improve Product.
Vol. 8, No. 11. November, 1936, *p.* 617.
Advantages of air conditioning test rooms at Westinghouse plant.

Air Conditioning a Production Tool Since 1926 at Bayuk Cigars Plant, by Rush D. Touton.
Vol. 8, No. 1. January 1936. *p.* 14.
How and to what extent Bayuk employs air conditioning; changes required by increased production and new developments; operation and maintenance of spray banks and nozzles; use of off-peak refrigeration; design factor for industrial air conditioning; relocation of equipment; life and construction of air conditioning equipment; advantages of building insulation and double sash; treatment of spray water to prevent sludge formation; cost and advantages of air conditioning; diagram of rearrangement of equipment on ceiling which released usable floor space.

Air Conditioning Benefits Surgical Supply Company.
Vol. 8, No. 11. November, 1936. *p.* 594.
Brief description of air conditioning for manufacture of sutures; the process; advantages of air conditioning.

Air Conditioning for Health—Air Conditioning Gaining Acceptance by Medical Profession, by C. P. Yaglou.
Vol. 8, No. 9. September, 1936. *p.* 502.
Early work of Dr. John Gorrie; original model of Dr. Gorrie's ice machine; use of air conditioning in premature nurseries, operating rooms, post-operative ward; artificial fever; treatment of various diseases by air conditioning.

Air Conditioning for Health—Air Conditioning, in Replacing Ventilation, Introduces a Newer Viewpoint, by C.-E. A. Winslow.
Vol. 8, No. 10. October, 1936. *p.* 543.
Replacement of conception of ventilating by air conditioning a significant advance; importance of effect of air temperature upon human health, comfort and efficiency; odors; radiant and convected heat.

Air Conditioning for Health—Cooperation with the Medical Profession, by Walter L. Fleisher.
Vol. 8, No. 8. August, 1936. *p.* 426.
What can be learned about air conditioning through cooperation with the medical profession; medical profession divided into two groups; work of Dr. Mills and Dr. Huntington on effect of climate on civilization; Dr. Mills' chart on effect of weather on business activities; a great opportunity for cooperative research.

Air Conditioning Improves Quality of Honey; Apiaries Get 100% Return on Investment.
Vol. 8, No. 5. May, 1936. *p.* 268.
Hodgson Apiaries, Jarvis, Ontario, Canada; reasons for air conditioning; conditions maintained; advantages.

Air Conditioning Installations.
Vol. 8, No. 2. February, 1936. *p.* 99.
Number of air conditioning installations and connected horsepower for air conditioning for 11 months of 1935, 1934, and totals to date for five cities, supplementing data given in January, 1936, issue.

Air Conditioning Installations in Houston.
Vol. 8, No. 4. April, 1936. *p.* 207.
Number of air conditioning installations and connected horsepower for air conditioning for Houston, Texas, for 1934, 1935, and totals at end of 1935, supplementing data on other cities in January, 1936, issue.

Air Conditioning Makes Severe Demands on Water Supply and Disposal Systems.
Vol. 8, No. 9. September, 1936. *p.* 491.
General review; Lincoln, Nebr., ordinance; water main capacities limited in Cincinnati; summary of papers and articles on the subject; abstract of paper on air conditioning in relation to water consumption by L. L. Lewis; demand for water; water conservation with evaporative condensers; discussion of use of raw water for condensing purposes by Walter L. Fleisher; New York City regulations.

Air Conditioning Review.
Vol. 8, No. 1. January, 1936. *p.* 1.
Number of installations and connected horsepower for air conditioning for 1934, first 11 months of 1935, and totals as of Dec. 1, 1935, in approximately 40 cities; break-down by type of job—industrial, commercial and public, residential—for 10 cities; percentage increases; prospects for 1936.

Air Conditioning Ruler Aids Use of Psych Chart, by William Goodman.
Vol. 8, No. 8. August, 1936. *p.* 430.
Description of ruler for solving air conditioning problems; method of use in following problems—total heat removed in cooling air, volume of air to circulate, weight of moisture condensed; reproduction of ruler.

Air Outlet Fixture Adapts Existing Ventilating Ducts to Conditioned Air Distribution.
Vol. 8, No. 9. September, 1936. *p.* 474.
Novel air outlet fixture for two story auditorium; details; photograph.

Air Conditioning Windowless Office Building, by A. Bowmann Snavely.
Vol. 8, No. 12. December, 1936. *p.* 675.
Hershey Chocolate Corp.'s windowless office building; brief description of air conditioning system; object of windowless design.

And Now—The Air Conditioned Billboard!
Vol. 8, No. 7. July, 1936. *p.* 364.
Wilson & Co. billboard, Chicago, has plate glass kennels in which are exhibited pedigreed dogs; air conditioning necessary; conditions maintained; equipment; insulation.

Apartment House in London Completely Air Conditioned, by J. W. Harvey.
Vol. 8, No. 9. September, 1936. *p.* 495.
Eaton House, London, England, air conditioned; choosing the type of system; separate system for each apartment; description of equipment; automatic control; silent operation essential; illustrations of equipment.

Ballroom Air Conditioning System Design and Control Complicated by Varying Day and Night Heat Loads, by F. W. Rabe.
Vol. 8, No. 6. June, 1936. *p.* 315.
Design of air conditioning system at Adolphus Hotel, Dallas, Texas; ammonia compressors; day and night ballroom cooling loads; evaporator design; use of psychrometric chart in computations; method of control; duct work; air conditioning flow diagram; rebuilt air compressor chills water.

Boulder Dam Engineers Solve Cooling, Ventilating Problems, by Carleton W. Campbell.
Vol. 8, No. 7. July, 1936. *p.* 386.
Controlling temperature of penstocks; ventilation of power house; heating offices and control rooms; cross-section of dam and photograph of model.

Box Strapping Holds Duct Insulation.
Vol. 8, No. 4. April, 1936. *p.* 210.
Ordinary steel box strapping used to hold board form duct insulation in place; method of installing; sketch.

Building Meters Air Conditioning Service, by Paul E. Holcombe.
Vol. 8, No. 8. August, 1936. *p.* 437.
Liquid refrigerant metered to allocate air conditioning costs between theater and balance of building load; three meters used; largest air cooled installation known.

Bureau of Standards Studies Determine Press Room Conditioning Requirements, by C. G. Weber.
Vol. 8, No. 3. March, 1936. *p.* 137.
Reaction of paper to humidity variations; determining proper press room air conditions; types of air conditioning systems for print shops; conditioning paper before printing; use of paper hygroscope; equilibrium moisture content of various papers; influence of moisture content variations on dimensions of lithographic papers; influence of hygrometric condition on moisture content change during multicolor printing.

Carlton Hotel Air Conditions, by T. D. Carson.
Vol. 8, No. 8. August, 1936. *p.* 439.
Carlton Hotel, Washington, D. C., one of first hotels to air condition bedrooms; earlier installation serves several rooms of eighth floor; the new installation: four fans supply bedrooms; control permits operating flexibility; evaporative condensers used.

Code for Ventilation and Air Conditioning.
Vol. 8, No. 6. June, 1936. *p.* 100 (*back section*).
Part XIII of heating code for Minneapolis, Minn., covering ventilation and air conditioning. (Also see p. 96, back section, July, 1936, issue.)

Comfort Cooled Bus Serves as Display Room.
Vol. 8, No. 10. October, 1936. *p.* 549.
Merchandise display bus comfort cooled; compressor; insulation.

Controls (Reference Sheet 1), by C. L. Ringquist.
Vol. 8, No. 9. September, 1936. *p.* 504.
Three diagrams showing methods of control of humidifying systems and cycles of operation.

Controls (Reference Sheet 2), by C. L. Ringquist.
Vol. 8, No. 10. October, 1936. *p.* 557.
Diagrams and description of five control systems for ventilating systems; explanation of operating cycles.

Controls, by C. L. Ringquist (Reference Sheet 3).
Vol. 8, No. 11. November, 1936. *p.* 618.
Diagrams and description of three control systems for ventilating systems; explanation of operating cycles.

Controls (Reference Sheet 4), by C. L. Ringquist.
Vol. 8, No. 12. December, 1936. *p.* 660.
Diagrams and description of three control methods for heating and ventilating systems, with explanation of cycles of operation.

Deep Well Water Does Double Job; Cools Offices, Then Goes to Process, by W. H. Wetherell.
Vol. 8, No. 12. December, 1936. *p.* 676.
Air conditioning system for office building of Dewey & Almy Chemical Co., Cambridge, Mass.; deep well water used in process bypassed through cooling and dehumidifying coils; zone control system for summer and winter; operation of controls.

Designing Vanes in Duct Elbows, by Samuel R. Lewis.
Vol. 8, No. 4. April, 1936. *p.* 208.
Designing intermediate vanes in square duct elbows of reducing type; chart for design of intermediate vanes; typical problem solved; sketch of solution.

Developing a Code for Comfort Air Conditioning, by L. A. Harding.
Vol. 8, No. 10. October, 1936. *p.* 555.
Brief review of background of code for comfort air conditioning for Buffalo, N. Y.; design temperature conditions; inlet temperatures; performance guarantees.

Drying with Lithium Chloride.
Vol. 8, No. 6. June, 1936. *p.* 325.
Brief description of method of drying industrial products by use of lithium chloride solution.

Early Comfort Cooling Plants, by G. Richard Ohmes and Arthur K. Ohmes.
Vol. 8, No. 6. June, 1936. *p.* 310.
Early methods of comfort cooling; method of cooling Vienna theater, 1900; newspaper artiele published in 1902; early hotel dining room job; Carnegie Music Hall installation, 1889; cooling a private home with mechanical refrigeration about 1893; dissecting room, 1899; New York Stock Exchange; paper on cooling and ventilation of hospitals, 1914; Cologne theater; Carnegie Safe Deposit Co., 1908; Metropolitan Museum of Art, 1907.

Effect of Air Conditioning Demand on City Water Supply and Sewer Systems, by Loran D. Gayton.
Vol. 8, No. 11. November, 1936. *p.* 609.
Effect of water required for air conditioning on Chicago's water supply and sewer systems; present water requirements; downtown area 16 per cent air conditioned; predicting future water demand; available supply; downtown sewer system overloaded by water wasted from air conditioning plants; possible solutions of the problem.

Engineering and Equipment for Air Conditioning Charted, by H. D. Betz.
Vol. 8, No. 5. May, 1936. *p.* 102 (*back section*).
Engineering and equipment required for air conditioning charted to show prospective purchasers what is involved; charts reproduced.

Even Rats Are Air Conditioned! by Paul W. Watson.
Vol. 8, No. 10. October, 1936. *p.* 557.
Air conditioned animal house at Abbott Laboratories, Chicago; calculating the cooling load; the installation and its control.

Fair Weather, by Charles L. Kribs, Jr.
Vol. 8, No. 8. August, 1936. *p.* 432.
Brief review of air conditioning installations at Centennial Exposition, Dallas, Tex.; conditioned exhibit spaces; fine arts museum conditioned throughout; steam unit heaters heat greenhouse; gas engine driven air conditioning compressors; air conditioning natural history museum.

For Comfort, Laboratory Insulates and Ventilates, by G. K. Saurwein.
Vol. 8, No. 6. June, 1936. *p.* 327.
Animal room for biology laboratory in attic; method of insulation and ventilation to maintain comfort, reduce animal death rate.

Get Ready Now for Winter Operation of Conditioning System, by Rush D. Touton.
Vol. 8, No. 10. October, 1936. *p.* 550.
Advantage of dividing operation procedures for air conditioning plants into seasonal intervals; surveying major equipment for winter operation; piping; humidification; air distribution; controls and instruments; insulation; building structure; electrical equipment; lubrication; fall overhauling and testing; check sheet for fall and winter air conditioning survey.

Glass Bricks Replace Windows, Reduce Condensation in Air Conditioned Plant, by L. Duckmann.
Vol. 8, No. 12. December, 1936. *p.* 656.
Windows at Oscar Heineman Corp. plant, Chicago, replaced with glass bricks; wooden sashed windows formerly used; method of installing the glass bricks; sketches.

Graphical Method of Determining Finned Coil Capacities Described, by E. P. Wells.
Vol. 8, No. 12. December, 1936. *p.* 665.
Factors affecting performance of finned dehumidifying coils; predicting performance of coil from a few tests; graphical method of presenting coil data; mechanism of heat transfer; finding the surface temperature; limitations of the method.

High Speed Sychronizing Motor Control for Air Conditioning Compressors Insures Minimum Lighting Disturbance, by R. C. Allen.
Vol. 8, No. 7. July, 1936. *p.* 370.
Necessity of synchronizing motors driving compressors for air conditioning; staggering compressor cranks; high speed synchronizing control at Kansas City Auditorium; diagram; operation; other applications; curve showing range of perceptible light flicker caused by voltage variations.

Hotels Find Air Conditioned Bedrooms Pay.
Vol. 8, No. 8. August, 1936. *p.* 441.
Brief reports of experience of thirteen hotels with air conditioned bedrooms; costs; methods; advantages; guests' remarks.

How to Avoid Trouble from Noise in Air Conditioning Installations, by P. H. Geiger.
Vol. 8, No. 11. November, 1936. *p.* 601.
Method of specifying loudness; comparison of loudness level and loudness scales; noise of air through grilles; comparison of loudness of grilles; correcting loudness curves for different size grilles; influence of surroundings on noise; sound absorption coefficients. (Also see December issue, p. 120, back section.)

How Much Noise Is Permissible? by P. H. Geiger
Vol. 8, No. 12. December, 1936. *p.* 657.
Permissible grille velocities; increase in loudness level of a room due to the addition of grille or other noise; instructions for use of curve; methods of reducing air conditioning equipment noise; flexible mountings; lining ducts.

How Sheet Metal Ducts Are Fabricated, by William Neubecker.
Vol. 8, No. 10. October, 1936. *p.* 542.
Seven types of construction for longitudinal duct seams; details; applications of each; supporting ducts.

Improving Office Air Conditions.
Vol. 8, No. 5. May, 1936. *p.* 124 (*back section*).
Answer to reader's question by Samuel R. Lewis; air cleaning and humidification required for office occupied by 50 persons; recommendations for installing equipment and its control.

Instruments Needed to Operate Air Conditioning Plants Properly, by William A. Hanley.
Vol. 8, No. 3. March, 1936. *p.* 139.
Temperatures and pressures to record for efficient operation of industrial air conditioning system; required recording instruments; maintenance of air conditioning systems; where failures occur; log sheet for recording operating data.

Keeping the Heat Out of Treated Space Leads to Economy in Air Conditioning, by Lester T. Avery.
Vol, 8, No. 1. January, 1936. *p.* 22.
Importance of surveying building to determine such changes as are economically sound before installing summer air conditioning system; restaurants are greatest offenders in having undesired heat sources; plan and elevation of typical restaurant used as example; table of heat gains before and after corrective treatment; methods of reducing heat gains—venetian blinds and awnings, wall insulation, ceiling treatment, hoods, lighting load; corrective treatment cuts heat load in half in this case.

Miniature Lake on Roof, Double Glass Walls, Cut Store Air Conditioning Load.
Vol. 8, No. 12. December, 1936. *p.* 659.
Air conditioned J. C. Penney Co. department store, Milwaukee, Wis.; roof cooled by waste condensing water; 20 tons refrigeration capacity saved; double glass walls used; power and water consumption.

Modernizing with Air Conditioning, by Anker Winther.
Vol. 8, No. 1. January, 1936. *p.* 7.
Why 15 story American Building, Cincinnati, Ohio, was air conditioned; considerations involved in choosing type of system; central station dehumidifier system decided upon; location of equipment; air circulation; new type of duct construction avoids expense of furring yet makes neat installation; duct layout for typical floor; control almost 100 per cent automatic.

National Silicosis Conference Outlines Objectives, by R. Campbell Starr.
Vol. 8, No. 8. August, 1936. *p.* 438.
Brief report of National Silicosis Conference; Secretary of Labor's remarks; silicosis as an employer problem; interest of labor; medical aspects of control; work of committees.

New Uses for the Psychrometric Chart in Simplifying Air Conditioning Problems, by William Goodman.
Vol. 8, No. 2. February, 1936. *p.* 87.
(Part 1); usefulness of psychrometric chart can be extended to solve many summer air conditioning problems for which it is not now utilized; absorption of sensible heat gains; absorption of moisture by air supply; absorption of total heat gain; the author's psychrometric chart; instructions for its use; table of heat ratio angles for various sensible heat ratios; examples.

New Uses for the Psychrometric Chart in Simplifying Air Conditioning Problems, by William Goodman.
Vol. 8, No. 3. March, 1936. *p.* 147.
(Part 2); required wet bulb of air supply; room conditions with given state of air supply; quantity of air circulated; typical problems solved graphically.

New Uses for the Psychrometric Chart in Simplifying Air Conditioning Problems, by William Goodman.
Vol. 8, No. 4. April, 1936. *p.* 197.
(Part 3); additional examples of solution of air conditioning problems; discussion of cases where sensible heat ratio is so low as to require reheating; table of quantity of air supply required for various rises in dry bulb temperature.

New Uses for the Psychrometric Chart in Simplifying Air Conditioning Problems, by William Goodman.
Vol. 8, No. 5. May, 1936. *p.* 262.
(Part 4); reheating chilled air supply to rooms having low heat ratios; run-around cycle; amount of sensible heat for reheating; temperature of air leaving cooling coils; sensible heat required for reheating for various dry bulb temperatures of air leaving cooling coils; typical problems worked out.

"Not Too Cool for Comfort," Hotel Metropole Advertises.
Vol. 8, No. 10. October, 1936. *p.* 541.
Balancing inside and outside temperatures in summer air conditioning; reproduction of advertisement of Hotel Metropole, Cincinnati, entitled "Not Too Cool on a Hot Day"; advantages of air conditioning hotel dining room.

Number of Air Conditioning Installations in Indianapolis and Vicinity.
Vol. 8, No. 6. June, 1936. *p.* 309.
Number of air conditioning installations, types of buildings conditioned, and horsepower for air conditioning as of April 15, 1936.

Operating Flexibility Features Air Conditioning and Heating of New St. Louis Auditorium.
Vol. 8, No. 5. May, 1936. *p.* 241.
Description of the building; air conditioned at 14 fan rooms; steam jet refrigeration; control of chilled water flow to dehumidifiers; sketch of chilled water risers; diagram of control of chilled water; operating instructions; the steam jet machines; cooling towers; pumping equipment; piping tunnel; detail of pipe guide; duct work and air distribution scheme; temperature and humidity control; recording and indicating instruments; motors and motor control; photographs of equipment; cross-section of building.

Pioneer User Says Air Conditioning Pays.
Vol. 8, No. 1. January, 1936. *p.* 18.
Remarks of M. A. Snyder, manager, Milam Building, San Antonio, Tex., on advantages of air conditioning office buildings; comments of tenants; air conditioning enabled renting basement space for cafe, cut cleaning and painting costs.

Purdue Experiment Station Reports on Effect of "Freon" on Fruit in Storage, by Clarence E. Baker.
Vol. 8, No. 3. March, 1936. *p.* 94 (*back section*).
Tests of "Freon's" toxicity to fruit described; apparently harmless to apples.

Savings Pay Operating Cost of Air Conditioning System, by A. J. Rummel.
Vol. 8, No. 4. April, 1936. *p.* 209.
Records of 12 months' operation of air conditioning system for insurance offices of United Services Automobile Association, San Antonio, Texas; description of system; sketches show details of system; control; cost of system, advantages of air conditioning, and saving achieved by utilizing air conditioning.

Standards for Air Conditioning Noise Control.
Vol. 8, No. 12. December, 1936. *p.* 652.
Section on noise control of revised edition of Chicago standards for comfort air conditioning; method of determining noise level of room.

Temperatures and Humidities for Tobacco Fermentation.
Vol. 8, No. 3. March, 1936. *p.* 114 (*back section*).
Answer to reader's question by Rush D. Touton; requirements vary; general recommendations.

The War on Noise, by Vern O. Knudsen.
Vol. 8, No. 9. September, 1936. *p.* 497.
Review of article on German developments in acoustics; German and American standards of noise measurement compared; measurement of impulsive sounds; filters for tubes and ducts; transmission of sound through walls and small openings; solid borne sounds; machine noises; curve showing relation between loudness and loudness level.

Place Air Intake to Avoid Pulling in Dust, by J. M. Pettingell.
Vol. 8, No. 9. September, 1936. *p.* 494.
Proper location of outside air intake; recommendations; what to avoid.

Portable Units Condition Air Liners.
Vol. 8, No. 7. July, 1936. *p.* 385.
Two types of portable cooling units used for precooling planes on the ground.

Power Requirements for Air Conditioning.
Vol. 8, No. 6. June, 1936. *p.* 328.
Power required depends upon application; floor area, volume, tons per 1000 sq ft, tons per 1000 cu ft for department store, office building, restaurant and theater; kilowatt hours per season per compressor horsepower. (Also see p. 377, July, 1936, issue.)

Pressure Losses in Rectangular Elbows, by R. D. Madison and J. R. Parker.
Vol. 8, No. 7. July, 1936. *p.* 365.
(Part 1); earlier tests; definition of terms—radius ratio, curve ratio; aspect ratio; apparatus and methods used in tests; effect of radius ratio; pressure loss in 90 deg elbows followed by ducts.

Pressure Losses in Rectangular Elbows, by R. D. Madison and J. R. Parker.
Vol. 8, No. 8. August, 1936. *p.* 427.
(Part 2); effect of aspect ratio; effect of degrees turn of elbow; effect of elbow size; effect of velocity.

Pressure Losses in Rectangular Elbows, by R. D. Madison and J. R. Parker.
Vol. 8, No. 9. September, 1936. *p.* 483.
(Part 3); effect of splitters on pressure loss; chart for determining location of elbow splitters; effect of elbows at the ends of ducts; effect of compound elbows on pressure loss; test results; pressure losses in elbows discharging directly into air; summary of Parts 1, 2 and 3.

Solving the Four Types of Process Air Conditioning Problems, by William Goodman.
Vol. 8, No. 6. June, 1936. *p.* 323.
(Part 1); all air conditioning problems fall into one of four classes depending upon whether sensible and latent heat are being added to or subtracted from the conditioned space; heating and humidifying; cooling and humidifying; quadrant on psychrometric chart into which each class of problem falls; tables of heat ratio angles; typical examples.

Solving the Four Types of Process Air Conditioning Problems, by William Goodman.
Vol. 8, No. 7. July, 1936. *p.* 373.
(Part 2); cooling and humidifying; heating and dehumidifying; cooling and dehumidifying; supplying latent heat deficiency; selecting condition of air supply; typical examples.

Supplement to the Chicago Air Conditioning Standards of October, 1935.
Vol. 8, No. 1. January, 1936. *p.* 156 (*back section*).
Supplement to Chicago standards for comfort air conditioning published in full; definitions; explanatory information on each section of the standards.

Temperature and Humidity Requirements for Air Conditioning the Meat Plant.
Vol. 8, No. 6. June, 1936. *p.* 312.
Table of temperatures and relative humidities most suitable for various departments of the meat plant.

Trouble Chart—Repulsion Induction Motors, by F. W. Butler.
Vol. 8, No. 6. June, 1936. *p.* 326
Symptoms and some of the most common causes of trouble with single phase repulsion induction motors; tests; remedies.

Tunnel Air Cools Hotel Guest Rooms.
Vol. 8, No. 9. September, 1936. *p.* 503.
Brief description of method of cooling guest rooms for Harding Hotel, Chicago, by means of cool air from freight tunnel system.

Use of Sewage Water as Condensing Medium for Air Conditioning Plants Has Possibilities, by E. P. Heckel.
Vol. 8, No. 12. December, 1936. *p.* 653.
Idea of using sewage water as condensing medium investigated; temperature; per cent of solids; acidity; scheme rejected for psychological reasons.

1200 Tons Refrigeration Required for Air Conditioning Kansas City Auditorium, by William L. Cassell.
Vol. 8, No. 9. September, 1936. *p.* 479.
Description of building; "Freon" refrigeration equipment; control of temperatures; air circulation; air distribution in auditorium; smoke exhaust; exhausting heat from lights; air washers and control; air conditioning exhibition space; theaters and other rooms; piping services and heating system; section through main auditorium; control board.

Two Well-Known Buildings to Be Air Conditioned.
Vol. 8, No. 4. April, 1936. *p.* 204.
Federal Reserve Bank and Wrigley buildings, Chicago, to be air conditioned; types of systems; photographs of the buildings.

"What Air Conditioning Did for My Business."
Vol. 8, No. 3. March, 1936. *p.* 140.
Comments of owners of air conditioning systems on business advantages of commercial air conditioning; candy shops; women's apparel store; drug store; warehouse of candy distributor; coffee shop.

What Is Air Conditioning?
Vol. 8, No. 10. October, 1936. *p.* 547.
Definition of air conditioning by A. C. Willard, President of the University of Illinois, at conference on air conditioning.

What the Operating Force Must Know for Effective, Efficient Air Conditioning, by Rush D. Touton.
Vol. 8, No. 9. September, 1936. *p.* 500.
Importance of instructing and training operating force; need of instruments; mistakes sometimes made; training should cover all fundamentals; information which should be furnished operating crew.

Why Cleaning's a Function of Air Conditioning.
Vol. 8, No. 11. November, 1936. *p.* 600.
Extract from address by J. J. Donovan; amount and kind of dirt in air in New York City.

Heating

After the Flood—Restoring Equipment to Service, by Samuel R. Lewis.
Vol. 8, No. 4. April, 1936. *p.* 196.
Brief review of how to restore heating, piping and air conditioning equipment to service after submergence in flood waters; boilers, electrical equipment, pumps, tanks, insulation, brick work; anchoring fuel oil tanks.

Boiler Combustion Space and Burner Control, by Kalman Steiner.
Vol. 8, No. 8. August, 1936. *p.* 444.
(A question and answer); firebox design for oil fired boilers; furnace volume, pitting the boiler; intermittent and high-low control; application of each.

Combustion Control for Oil Fired Boiler Plants, by Kalman Steiner and Paul R. Unger.
Vol. 8, No. 10. October, 1936. *p.* 544.
Primary object of combustion control system; five major factors; combustion controllers; draft controllers; synchronizing air to oil flow; regulation of oil pressure and compensation for oil viscosity; compensation for changes in pressure drop through boiler; diagram of metering type combustion control system.

Controlling Construction Costs, by C. C. Wilcox.
Vol. 8, No. 7. July, 1936. *p.* 378.
Committment method and weekly analyses enable control of expenditures for constructing central heating plant at St. Mary's Academy, South Bend, Ind.; method used; analysis of cost and man-hours of labor; brief description of plant.

Control Matches Boiler Operation to Hotel's Heat and Steam Requirements.
Vol. 8, No. 3. March, 1936. *p.* 135.
Gas fired boiler plant at 250-room Hotel Orlando, Decatur, Ill.; steam formerly purchased; importance of operating flexibility in a hotel; steam services; typical day's operation; the plant and its control; chart showing percentage of stack losses; gas consumption for month of January, 1936, and degree days.

Control of Indirect Water Heaters.
Vol. 8, No. 1. January, 1936. *p.* 178 (*back section*).
Answer to reader's question by Samuel R. Lewis; where install aquastat?

Efficiencies With Various Fuels.
Vol. 8, No. 6. June, 1936. *p.* 116 (*back section*).
Answer to reader's question by Paul R. Unger; boiler efficiencies with various fuels; factors affecting efficiency.

Forced Circulation Hot Water System Heats Plant in Change-Over, by Samuel R. Lewis.
Vol. 8, No. 1. January, 1936. *p.* 31.
Plant troubled with corrosion of heating system steam and return piping; high pressure steam employed; description of system; system changed to forced circulation hot water; change-over presented interesting problems; copper piping with sweat fittings used; control of and balancing the system; heat exchanger for heating circulating water with steam; open hatchway blanketed with warm air; diagrams of old and new systems; piping details.

Gas in Summer, Oil and Coal in Winter, Carry Palmer House Hotel Heating Load.
Vol. 8, No. 1. January, 1936. *p.* 12.
Boiler at Palmer House, Chicago, fired with gas in summer, oil in winter; description of the installation; method of control; gas consumption and efficiency; brief description of heating, piping and air conditioning services at this hotel; photos of gas and oil fired boiler; close-up of gas header; turbine driven gas boosters.

Handling Fuel Oil, by Kalman Steiner.
Vol. 8, No. 2. February, 1936. *p.* 91.
(Part 3); calculation for pressure drop in piping; selection of

pumping equipment; cost of pumping oil; horsepower requirements; sample problems computed.

Handling Fuel Oil, by Kalman Steiner.
Vol. 8, No. 3. March, 1936. *p.* 145.
(Part 4); methods of regulating oil pressure; types of oil strainers; strainer requirements and maintenance.

Handling Fuel Oil, by Kalman Steiner.
Vol. 8, No. 4. April, 1936. *p.* 201.
(Part 5); types of valves used; orifice plates; other flow regulators; advantages and disadvantages of each.

Heating and Ventilation of a Modern High School Building, by Robert P. Schoenijahn.
Vol. 8, No. 9. September, 1936. *p.* 469.
Pierre S. duPont high school, Wilmington, Del.; the boiler plant; stokers; soot blower system; turbine driven condensate vacuum pump; layout of steam mains; welded supply and return piping; insulation; traps; hot water service; unit ventilators and control; heating and ventilating gymnasium; program clock control cuts electrical demand; exhaust systems; summary of equipment.

Heating 10,000 Hens, by Kalman Steiner.
Vol. 8. No. 12. *December,* 1936. *p.* 657.
"White elephant" real estate investment converted into "poultry farm"; 10,000 egg laying hens occupy six-story industrial building; ventilating and heating requirements; oil fired boilers; air exhaust system; control of the fans and the burners; fuel consumption double the estimate; new thermostat settings and fan timer solve the problem; use of operations recorder in checking operation of system; a field for air conditioning?

How to Operate Oil-Fired Heating Plants Efficiently, by Paul R. Unger and Kalman Steiner.
Vol. 8, No. 5. *May,* 1936. *p.* 255.
Cleanliness the cardinal virtue; maintenance of equipment—flues, strainers, burner nozzles and tips, fans and blower wheels, oil heaters, storage tank; diagram showing method of valving oil preheater to permit cleaning; checking performance of safety devices—float operated devices, mercury tubes, relays, combustion safety switches, stack switches; fire hazard of storage tanks.

Moisture Retained by Coal.
Vol. 8, No. 1. *January,* 1936. *p.* 180 (*back section*).
Answer to reader's question by P. Nicholls; maximum percentage of water held by a ton of coal.

Outdoor Temperature Graph Aids in Heating Building for Morning Occupancy, by Joseph W. Degen.
Vol. 8, No. 2. *February,* 1936. *p.* 100.
Time—temperature graph used at Equitable Building, New York City, for better operation of heating system; enables operating engineers to see trend of temperature; diagram of the graph showing construction; results of its use.

Practical Heating—Boiler Ratings, by Harold J. Taylor.
Vol. 8, No. 3. *March,* 1936. *p.* 153.
Piping and pick-up load; oil burning boilers; steel boiler ratings; water heating load; multipliers for heat emission of radiation for air temperatures other than 70 F; Btu per hr heat emission for conditions other than standard; multipliers for temperature range other than 0-70 F; Btu per sq ft per hr with various water temperatures in radiator.

Practical Heating—Installing Vacuum Equalizing Line, by Harold J. Taylor.
Vol. 8, No. 7. *July,* 1936. *p.* 383
Installing vacuum equalizing line with two pipe vapor-vacuum heating systems to safeguard steam boiler from low water; method of installing; advantages.

Practical Heating—Notes on Unit Heaters, by Harold J. Taylor.
Vol. 8, No. 4. *April,* 1936. *p.* 203
Notes on correcting troubles caused by improper installation and maintenance; dirt; valves; traps; electrical; multi-speed motors; control; boiler load; hot water jobs; summer operation; diagrams showing piping.

Practical Heating—Notes on Vacuum and Condensation Pumps, by Harold J. Taylor.
Vol. 8, No. 7. *July,* 1936. *p.* 382.
Use of condensation and vacuum pumps; installation; suggestions for correcting troubles.

Practical Heating—Sizing Steam Coils for Heating Water, by Harold J. Taylor.
Vol. 8, No. 8. *August,* 1936. *p.* 434.
Figuring apartment building job; recommendations where water is hard; selecting the boiler; lineal feet of pipe per sq ft of surface; "heating power" of brass and iron pipe.

Practical Heating—Trouble-Shooting on Indirect Heater Jobs, by Harold J. Taylor.
Vol. 8, No. 6. *June,* 1936. *p.* 313.
What to check if heater fails to heat; suggestions for correcting the possible difficulties.

Pure Oil Building Cuts Cost of Heating, by Clyde Maxwell.
Vol. 8, No. 8. *August,* 1936. *p.* 421.
Opportunities to achieve economies in heating costs exist in many buildings; economies made at Pure Oil Building, Chicago; test run before and after reconditioning; rehabilitation of boilers; radiators and traps; pumping water; water treatment.

Reliable Steam Consumption Records Mean Better Heating at Minimum Cost, by Lyman R. Flook.
Vol. 8, No. 6. *June,* 1936. *p.* 320.
Importance of reliable records to economical operation of heating system; steam conservation efforts at University of Chicago; flow meters; meter testing; use of flow meter readings, monthly reports, analysis of steam consumption by groups of buildings, master record and budget forecast, and other forms.

Revamping the Building Heating System in the Modernization of Conners Creek, by Sabin Crocker.
Vol. 8, No. 1. *January,* 1936. *p.* 25.
Modernization of Conners Creek power house of Detroit Edison Co.; heat emission of power equipment upsets radiation computations; summary of building heating requirements; use of unit heaters; heating requirements of switching station; ventilation of turbine room; steam for building heating bled from turbo-generators; sections through generators showing control; relation of throttle steam flow, electrical output, and bled steam available for heating; use of high temperature steam for building heating; vacuum returns system; flow diagram of equipment in heating returns pit; temperature control; salvaging of old equipment.

Saves 16% Fuel by Modernizing Apartment Heating, by R. C. Nason.
Vol. 8, *No.* 4. *April,* 1936. *p.* 195.
High fuel costs in apartment building because of excessive draft; automatic smoke breeching damper installed; coal consumption reduced, other advantages.

Sixty Gas Fired Units Heat Pier Exhibit Space.
Vol. 8, No. 4. *April,* 1936. *p.* 202.
One of largest unobstructed exhibit spaces in world—Chicago's Navy Pier—heated by gas fire unit heaters; rating and installation of units; design conditions; supplying and metering gas; photograph of installation of pressure regulators.

The Nemours Carillon Tower, by Lee P. Hynes.
Vol. 8, No. 10. *October,* 1936. *p.* 536.
Description of Nemours Carillon Tower, Wilmington, Del.; electricity used for heating; unique heating problems involved; special insulation treatment; dew point control prevents condensation in substation room; flood lighting; lightning protection; electrical operation of bells; views of interior and electrical equipment.

To Modernize with New Central Heating Plant.
Vol. 8, No. 2. *February,* 1936. *p.* 98 (*back section*).
Answer to reader's question by Samuel R. Lewis; recommendations for design and layout of central heating system for university.

Trapping and Venting Blast Coils.
Vol. 8, No. 10. *October,* 1936. *p.* 116 (*back section*).
Answer to reader's question by Samuel R. Lewis; recommendations for trapping and venting blast coils.

Trouble-Shooting—Bringing Back the Missing Water Line, by H. G. Schaefer.
Vol. 8, No. 1. *January,* 1936. *p.* 11.
Zoned heating system under thermostatic control for heating parochial school and church; steam condensing in zone system created vacuum, causing boiler water line to drop; trouble overcome by installing vacuum breaker in main.

Unit Heating and Cooling, by Samuel R. Lewis.
Vol. 8, No. 11. *November,* 1936. *p.* 587.
Comparison of power requirements for central blast heating system and unit heating system; control of unit heating and ventilating systems; recirculating unit heaters; cooling with units; location of unit heaters; air velocity; steam pressure.

What the Operating Engineer Should Know About the Combustion Process and Boiler Efficiency, by Paul R. Unger and Kalman Steiner.
Vol. 8, No. 7. *July,* 1936. *p.* 361.
Combustion processes illustrated; hypothetical volume of air entering firebox, participating in combustion, and emerging as flue gas; oxygen, nitrogen, hydrogen, carbon dioxide; flue gas analysis and its use; checking combustion process; average stack loss for various percentages of carbon dioxide and various stack temperatures for bituminous coal, fuel oil and natural gas; importance of correct mixture of fuel and air.

Piping

Alloy Steels for Welded Power Piping, by J. R. Dawson.
Vol. 8, No. 8. *August,* 1936. *p.* 435.
Abstract of paper presented at Midwest Power Engineering Conference; choice of materials; creep strength; corrosion resistance; corrosion in valve parts; welding alloy steels; alloys most useful in steel; low chromium and high chromium steels and their uses; metallurgical considerations in welding.

Condensate Removal from Cooking Kettles, by John W. Hieronymus.
Vol. 8, No. 4. *April,* 1936. *p.* 205.
Cooking time and steam consumption reduced by proper trap selection and piping; test data on consumption and condensate removal from cooking kettles; diagram of test set-up; sizing supply and condensate piping; air removal imperative; steam loss with cracked valve; steam requirements of kettles; tables of temperature reduction caused by air at various pressures, cost of steam leaks, steam condensed per sq ft of jacketed kettle condensing surface, and steam condensing area of kettles.

Conserves Compressed Air for Sewage Ejection by Taking Tip from Ancient Greek (Practical Piping Problems), by H. G. Schaefer.
Vol. 8, No. 5. *May,* 1936. *p.* 254.
Conservation of compressed air for sewage equipment; diagram and explanation of piping layout used; method of operation.

Correcting Flow Meter Readings, by William Goodman.
Vol. 8, No. 11. *November,* 1936. *p.* 592.
Principle of flow meter operation; correcting for pressure changes; correcting for steam quality and superheat; plant alterations cause meter errors; example.

Design of Modern Industrial Piping Systems—Support of Pipe Lines, by F. L. Snyder and T. E. Bridge.
Vol. 8, No. 2. *February,* 1936. *p.* 93.
Simplified method for determining location of pipe supports; design of spring hangers; distance between supports; spring design data tabulated; table of properties of pipe; nomograph for deflection of pipe between supports; nomograph for fiber stress in pipe walls due to internal pressure; graph of modulus of elasticity, allowable fiber stress, and thermal expansion of pipes; table of weight of pipe insulation per foot; example shows use of data; suggested designs and dimensions for hangers and supports.

Design of Modern Industrial Piping Systems—Support of Pipe Lines, by F. L. Snyder and T. E. Bridge.
Vol. 8, No. 4. *April,* 1936. *p.* 189.
Simplified method of designing supporting columns for pipe lines; advantages of circular cross-section; foundations; step-by-step example of design of supports showing use of data presented; example showing design of foundations; charts for design of columns and foundations; photographs of supports designed by method given.

Distillery Piping Requirements—and How They Were Met at the World's Largest Distillery, by B. C. Stewart.
Vol. 8, No. 5. *May,* 1936. *p.* 249.
New plant of Hiram Walker & Sons, Peoria, Ill., the distillery process; service piping systems—water, gas, hot water, steam; process piping systems—grain, meal, mash, yeast, beer, slop, concentrated slop, carbon dioxide, distilled water, alcohol, industrial alcohol, fusel oil and aldehydes; table of piping services, piping materials, and maximum diameters of lines; photographs of equipment.

Estimating Piping—Method Outlined, Principles Explained, by E. W. Norris.
Vol. 8, No. 1. *January,* 1936. *p.* 19.
Importance of the estimate; the various items—plan, list of

material and costs, cost of labor; example of estimate of turbine lead shows use of suggestions given; method the same for larger jobs.

Estimating Piping—Preparation of Sketches, by E. W. Norris.
Vol. 8, No. 3. March, 1936. *p.* 151.
Preparation of sketches for estimating and as preliminary to formal plans and specifications; flow diagram an effective tool; valve location; size of lines; providing for flexibility; selecting classes of material to be used.

Expansion of Jacketed Pipe Line.
Vol. 8, No. 1. January, 1936. *p.* 24.
Answer to reader's question on article by G. W. Hauck, November, 1935, issue; construction of jacketed piping; no trouble from unequal expansion with method used.

Field Tests Check Analyses of Stresses and Change of Shape in Expansion Bend, by E. A. Wert and S. Smith.
Vol. 8, No. 12. December, 1936. *p.* 661.
Main steam cross-over of unusual length in the form of a large expansion bend installed at Conners Creek power plant; limited space available required analysis of expansion movement; designing for flexibility; movement of the structure; grapho-analytical analysis; movement tested after erection; supporting the line; anchors incorporate rolling feature; selecting shape of the pipe structure; necessity of analyzing change of shape of pipe line in travelling from cold to hot position; comparison of theoretical and actual movements; diagrams and illustrations of line.

Flanged Piping Joints—Methods for Applying and Determining Bolt Stresses, by E. C. Petrie.
Vol. 8, No. 6. June, 1936. *p.* 303.
Pressure retaining efficiency of a bolted flanged connection; tests made; bolting materials; instrument for measuring bolt elongation; methods for determining bolt loads — torque method, elongation method; test set-up for 20 in., 1500 lb cast steel flanged joint; data for practical application of bolt loads; method of inducing bolt elongation by heat; application of torque method; torque-stress relationship tests; effect of thread lubrication; effect of thread form; test results, torque-strain relationship, alloy steel bolts; torque-size relationship, coarse thread and alloy steel bolts; tables of torque-stress relationships and foot-pounds to produce given stress in alloy steel and coarse thread bolts.

Friction Effect of Slip Joints, Rollers and Guides on Long Steam Transmission Pipe Lines.
Vol. 8, No. 7. July, 1936. *p.* 372.
Results of investigation on 8,000 ft, 12 in. main; expansion of piping; coefficients for metals used in pipe.

Fundamentals of Joint Design for Welded Piping Systems, by S. C. Clark.
Vol. 8, No. 10. October, 1936. *p.* 552.
The butt type weld; requirements in weld design; angle of bevel; joint spacing; tack welds; weld cross-section; inside and outside corner welds; fillet welds.

Fusion Welded Power Piping, by W. D. Halsey.
Vol. 8, No. 12. December, 1936. *p.* 647.
Paper presented at annual meeting of *International Acetylene Association;* quality of welding for high pressure piping; requirements of *A.S.M.E.* code; X-ray examination; stress relieving; new inspection procedure for pipe lines adopted by Hartford Steam Boiler Inspection and Insurance Co.; test specimens and qualification of welders; standards for welded joints; defects; encouraging operator to do his best work.

Holding Properties of Gaskets Studied. Translation and discussion by F. E. Wertheim.
Vol. 8, No. 7. July, 1936. *p.* 367.
Translation of report of German investigation; gaskets tested hydrostatically and under steam pressure; test set-up; results of tests on metallic and non-metallic gasket materials; discussion by translator; use of various gasket materials.

How to Design Steam Piping for Maximum Capacity and High Pressure Drop, by Max W. Benjamin.
Vol. 8, No. 9. September, 1936. *p.* 475.
Phenomenon of acoustic velocity; limit imposed on capacity of pipe line; two classes of service where acoustic velocity limit occurs; restricted application of usual formulas for pressure loss in piping; behavior of gases and vapors having adiabatic exponent greater than unity illustrated; exponents of substances; diagrams showing relationships between pressure drop, length of pipe line, and weight of flow for steam; approximate values of acoustic velocities for steam; example of design of exhaust line from turbine to condenser illustrates use of the data; note by Sabin Crocker on use of the information.

How to Make a Pipe Templet, by S. C. Clark.
Vol. 8, No. 7. July, 1936. *p.* 384.
Layout of mitered joints for direction changes in 200 ft, 20 in. oxy-acetylene welded pipe line; instructions for making templet; cutting the pipe.

Method of Designing a Heat Exchanger, by T. J. Knuders.
Vol. 8, No. 10. October, 1936. *p.* 548.
Design of pit type heat exchanger or reclaimer worked out in detail; calculations for amount of heat exchange surface.

Multi-Layer Oxy-Acetylene Pipe Welding, by R. M. Rooke and F. C. Snecke.
Vol. 8, No. 11. November, 1936. *p.* 613.
Paper presented at *American Welding Society's* annual meeting; advantages of multi-layer welding; comparison of weld metal cross-sections; process of making a three-layer rolling pipe weld; shape of the layers; welding technique; tests of multi-layer welds; recommended number of layers.

Multi-Layer Oxy-Acetylene Pipe Welding, by Arthur N. Kugler.
Vol. 8, No. 12. December, 1936. *p.* 677.
(Part 2); paper presented at *American Welding Society* annual meeting; use of multi-layer welding; description of welding of two power piping installations; qualifying operators; reduced section tensile tests; free bend tests; nick break tests; reverse bend tests; test data tabulated; merits of multi-layer welding; recommended procedure for various pipe wall thicknesses.

Piping and Pumping Process Materials, by Lee P. Hynes and Charles D. Campbell, Jr.
Vol. 8, No. 1. January, 1936. *p.* 3.
Requirements for piping various process materials; molasses and similar syrups; unloading molasses from cargo steamers; waxes, resins, and shellacs; gas impregnated materials handled at sub-zero temperatures; horsepower and discharge pressures; installation of pumps and piping; cold weather precautions; conversion table; oil measurement table at 60 F.

Piping at Boulder Dam, by Carleton W. Campbell.
Vol. 8, No. 4. April, 1936. *p.* 200.
Size of the project; penstock system; power house piping; cooling water system for generators; penstock details.

Piping Plays Important Part at Schrafft's, by L. P. Leathers, with Francis A. Westbrook.
Vol. 8, No. 12. December, 1936. *p.* 654.
Description of piping at W. F. Schrafft & Sons Corp. plant, Boston, Mass.; chilled water piping for air conditioning; water tested and treated to prevent corrosion and clogging of nozzles; brass pipe headers; nozzle openings tested with plug gauge; piping requirements for melted chocolate and corn syrup; screwed wrought iron pipe used for plumbing lines; insulation of the piping; method of conserving process water.

Piping Slurry and Cement at a Modern Mill, by Ralph H. Butz.
Vol. 8, No. 8. August, 1936. *p.* 442.
Slurry and cement piping at National Portland Cement Co., Brodhead, Pa.; process explained; layout of piping.

Plant Adopts Piping Identification Scheme, by W. W. Watkins.
Vol. 8, No. 6. June, 1936. *p.* 319.
Scheme of piping identification adopted by rubber products plant; instructions for painting piping, valves, and fittings.

Power Piping Requirements, by J. Roy Tanner.
Vol. 8, No. 7. July, 1936. *p.* 388.
Abstract of paper presented at Midwest Power Engineering Conference; use of welding; fabricated piping; standardization; compensating for loss of strength where pipe walls are cut for branches.

Power Plant Piping.
Vol. 8, No. 10. October, 1936. *p.* 547.
Creep; use of alloy steels; hard facing valves.

Practical Piping Problems—How to Select a Pump for Evacuating a Tank, by S. B. Redfield.
Vol. 8, No. 3. March, 1936. *p.* 141.
Method of selecting pumping equipment for evacuating a tank, as required in various process industries; what is required of the vacuum pump; step-by-step solution of the problem explained; assumed characteristics of pump used in example; time curve; selecting pump to evacuate tank in a given time; handy guide for estimating time required to evacuate tank and selecting pump.

Solving Stresses in Piping Offsets Subject to Compressive Load from an Expansion Joint, by A. R. Pettit.
Vol. 8, No. 8. August, 1936. *p.* 423.
Exact calculation of stresses in piping offsets tedious; short method of calculation offered; typical example calculated by short method and by grapho-analytical method; comparison of results.

Strength and Design of Covers and Flanges for Pressure Vessels and Piping, by T. McLean Jasper, H. Gregersen, and A. M. Zoellner.
Vol. 8, No. 11. November, 1936. *p.* 605.
(Part 1); investigation establishes methods for design of covers and flanges; covers; ring flanges; comparison between results obtained from formulas and plaster of paris test flanges; variation of external moment with flange thickness; variation of external moment with flange width; test points and theoretical curves plotted.

Strength and Design of Covers and Flanges for Pressure Vessels and Piping, by T. McLean Jasper, H. Gregersen, and A. M. Zoellner.
Vol. 8, No. 12. December, 1936. *p.* 672.
(Part 2); hubbed flanges; formulas for design; fillet coefficients.

Table of Properties Aids Piping Design, by F. L. Snyder.
Vol. 8, No. 6. June, 1936. *p.* 328.
Properties of pipe, sizes 14 in. to 36 in. O. D.; explanation of use.

Table of Properties of Pipe Aids Piping Design, by F. L. Snyder.
Vol. 8, No. 5. May, 1936. *p.* 258.
Properties of pipe, sizes ⅛ to 12 in.; explanation of use.

Underground Piping for Central Refrigeration Service, by R. H. Switzler.
Vol. 8, No. 7. July, 1936. *p.* 380.
Abstract of paper presented at International Congress of Refrigeration; history of central refrigeration in St. Louis; construction features of pipe line; operating problems encountered; direct expansion system compared with brine circulating system.

Use of American Standard Pipe Thickness Schedules, by Arthur McCutchan.
Vol. 8, No. 10. October, 1936. *p.* 531.
(Part 1); American Standard for Wrought Iron and Wrought Steel Pipe approved November, 1935; purpose of standard; schedule numbers; pipe wall thicknesses; allowances for threading, mechanical strength and/or corrosion; allowable *S* values for steel pipe; example shows selection of pipe thickness schedule; table of properties of pipe for Schedules 10, 20, 30 and 40.

Use of American Standard Pipe Thickness Schedules, by Arthur McCutchan.
Vol. 8, No. 11. November, 1936. *p.* 595.
(Part 2); significance of ratio of working pressure to allowable stress in selecting pipe wall thicknesses; tables of properties of pipe for Schedules 60, 80, 100, 120, 140, 160 pipe; significance and use of the properties tabulated.

Valve Design and Construction for High Pressure Piping, by H. H. MacMillen.
Vol. 8, No. 5. May, 1936. *p.* 265.
(Presented at Midwest Power Engineering Conference, Chicago, April, 1936); description of Port Washington Station, Milwaukee, Wis.; location of valves; drain lines, exhaust header, auxiliary piping; materials of valve construction; piping, flanges, and bolting; cross-section of 18 in., 600 lb gate valve.

Welding Lead Sheets and Pipe, by F. E. Rogers.
Vol. 8, No. 9. September, 1936. *p.* 487.
Applications of lead burning or welding of lead with a gas torch; applying linings to tanks; chemical lead; antimonial lead; cleaning, preparation and forms of joints; how joints are made and welded; torches and gases; weight of lead and sizes of burning bars; lead pipe welding; lead pipe sizes used in chemical plants; illustrations showing proper methods of preparing and making welds.

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